

SUMMARY OF INSECT SURVEY
MADE IN CONNECTION WITH HEPTANE PRODUCTION EXPERIMENT
IN JEFFREY PINE NEAR HARVEY RANGER STATION, LASSEN NATIONAL FOREST

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A turpentine experiment in Jeffrey pine was started near the Harvey Valley Ranger Station in 1926 by the California Forest Experiment Station. The primary object of this project was the production of heptane. The California Chemical Company leased an area containing a high percentage of Jeffrey pine, on which production was tested out on a small scale by the commercial methods of turpentine. In addition Mr. N.C. Tihomiroff, under the direction of Mr. Hill, carried on an experimental study of methods on a small area adjoining that used by the commercial company. On both the experimental and commercial areas Mr. Tihomiroff noted a few trees attacked by bark-beetles during the course of the 1927 season.

The same studies were continued during the season of 1928. Mr. W.D. Bedard, a student of forest entomology at Syracuse, was assigned to the job of continuing the records on the experimental work. Through an agreement and financial arrangement with the Bureau of Entomology station at Palo Alto, part of Bedard's time was made available for entomological studies in connection with the project. It was planned to keep sufficient records to determine whether or not the facing of the trees to produce resin flow would result in a perceptible increase of barkbeetle attacks within the area.

Insect Hosts Involved

Both yellow pine and Jeffrey pine occur in mixture in a mature stand on this area, the latter predominating. In yellow pine the western pine beetle (Dendroctonus brevicornis) is the primary enemy. This insect does not attack the Jeffrey pine. In Jeffrey pine Dendroctonus jeffreyi is the primary enemy, and this in turn does not attack yellow pine. The turpentine beetle, Dendroctonus valens, and two species of Ips beetles are common to both hosts. These insects were all common on the area before the experiments were started.

Methods Used in Insect Surveys

In June 1928 plans were outlined by the writer for a survey and marking of insect-killed trees on both the turpentine area and an adjoining check area. This survey was completed on August 20 by Mr. Bedard.

Sections 23 and 24, T 33 N, R 8 E, were selected as the basis for this study. Practically all of Section 24 was covered by the commercial turpentine operations in 1927 and 1928. About 80 acres in the NE $\frac{1}{4}$ of Sec. 23 were used for the experimental work carried on by Mr. Tihomiroff. On the balance of this section no trees were faced, and it was cruised as a check area.

Both sections were cruised by the use of five-chain strips run by compass line, covering 100 per cent of the area.

All trees killed by insects during the seasons of 1926 and 1927 were marked, numbered and mapped. Trees attacked by insects during the season of 1928 were also included, but only a limited percentage of the attack of this year could be located at the time of the cruise. Individual records of the d.b.h. log lengths and primary insects were kept for all trees marked.

Summary of Data

JEFFREY PINE KILLED BY DENDROCTONUS JEFFREYI

	<u>Section 23</u>		<u>Section 24</u>	
	<u>No. Trees</u>	<u>Volume</u>	<u>No. Trees</u>	<u>Volume</u>
1926 Loss (J)	12	16,510	25	40,140
1927 Loss (K)	26	29,620	39	72,200
1928 Loss (L) (incomplete)	2	5,690	11	19,440

YELLOW PINE KILLED BY DENDROCTONUS BREVICORNIS

	<u>Section 23</u>		<u>Section 24</u>	
	<u>No. Trees</u>	<u>Volume</u>	<u>No. Trees</u>	<u>Volume</u>
1926 Loss (J)	13	18,410	8	11,280
1927 Loss (K)	24	54,530	14	20,560
1928 Loss (L) (incomplete)	3	5,180	2	2,920

These records show that on both the turpentine and the check areas the infestation of 1927 was nearly double that of 1926. As only a few of the trees attacked in 1928 could be located at the time of the cruise, it could not be determined whether a further increase occurred this season. This point can be determined only by a similar cruise to be made during the season of 1929, when all the 1928-attacked trees can be distinguished by their faded foliage.

Toward the close of the 1928 season the men engaged on the commercial operation of the California Chemical Company complained that many of the faced trees from which they were collecting were being attacked by barkbeetles. Late in September Mr. Bedard and the man in charge of the operation made a check of the faced trees on the commercial area and found that about four per cent of them were attacked.

This would indicate a considerable increase of the Jeffrey beetle infestation in 1928, though this point cannot be accurately determined until 1929. If an increase is found to have occurred, it may indicate a general augmentation throughout the region or merely a local concentration within the commercial area.

Further Work Necessary to Complete Study

A similar cruise should be made in 1929 to record accurately the extent of the 1928 infestation, both upon the turpentine and the check sections. After these data have been summarized it will be possible to determine whether it will be desirable to continue records any further.

J. M. Miller

Senior Entomologist.

Forest Insect Laboratory,
Palo Alto, Calif.,
November 20, 1928.

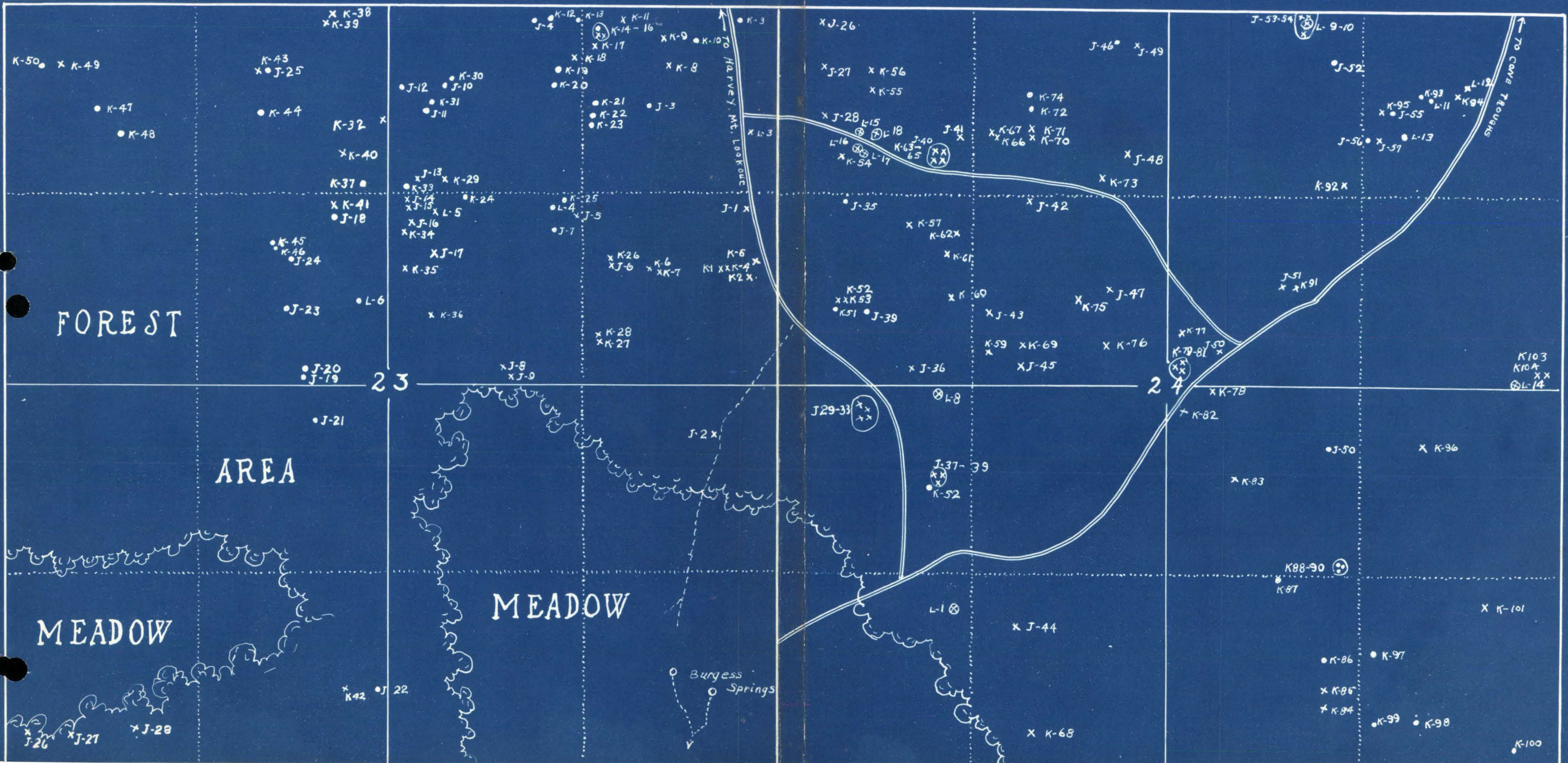


CRUISING MAP

Section 23, 24
T. 33N - R. 8E

Scale
1/16 1/8 1/4 mi

- x - Pinus jeffreyi
- - Pinus ponderosa
- Road
- ⊙ - Jeffrey Pine with brood records



PROGRESS REPORT ON INSECT SURVEYS
OF HARVEY VALLEY HEPTANE PRODUCTION CHECK AREAS
LASSEN NATIONAL FOREST

Salman - June 6, 1930

Introduction

A survey of sections 23 and 24, T 33 N, R 8 E, M.D.M., in Harvey Valley, Lassen National Forest, was made during the period May 22-27, 1930, for the purpose of spotting and marking trees killed by insects during the seasons of 1928 and 1929. In addition, it was desired to make a final survey of insect conditions in the check area (Sec.23) and in the area (Sec.24) utilized by the California Chemical Company and the California Forest Experiment Station during the seasons of 1926, 1927 and 1928 in the commercial and experimental production of heptane. The spotting and marking of trees on both sections and the compass work on Sec.23 was done by Mr. J.M. Miller and the writer. Mr. John Everitt, Assistant Supervisor of the Lassen National Forest, cooperated in the road survey of the area east of Sec.24 and served as compassman in the survey of Sec. 24.

History of Area

There has been no felling of trees or production of heptane since the summer season of 1928, so that the data collected by Mr. Bedard during the seasons of 1926, 1927 and 1928 (incomplete) are indicative of insect losses during the seasons of production. Mr. Miller's report of Nov. 20, 1928, on this area summarized these data, and he also described the boundaries and forest type of the areas included in Bedard's survey. The areas dealt with in the present survey are the same as those discussed by Mr. Miller.

Methods

A 100 per cent cruise of Secs. 23 and 24 was made. Five-chain strips running north and south were used, but where the forest stand permitted ten-chain strips were utilized. Cruising was done with a box compass. Trees that were killed during the seasons of 1928 and 1929 were spotted, examined and marked, a tree record being filled out for all trees found. In addition, a road-strip cruise two miles long and extending into the forest approximately five chains on each side of the road was made along the Cone Trough road, which runs approximately northeast from near the northeastern portion of the eastern limit of Sec. 24. A similar cruise was made along the same road within the limits of Sec. 24 in order that a comparison might be carried out with the area to the east of that section.

*Miller - 11/20/31
CLH - 11/3/31
Sent to
DF.
F.S.
F.C.C.
11/16/30*

Summary of Data

		: Western Yellow Pine :		Jeffrey Pine		:Year-Section Totals		Approx.Value	Causes of Death		
Sec.:	Year	No.Trees:	Volume b.f.:	No.Trees:	Volume b.f.:	No.	Volume b.f.:	of	D.b.:	D.j.:	Misc.
		: Killed	:Trees Killed:	: Killed	:Trees Killed:	Trees :		: Timber	:	:	:
	:1926(J):	13	: 19,420	: 12	: 17,070	: 25	: 36,490	: \$146	: 13	: 12	:
	:1927(K):	24	: 35,960	: 26	: 30,730	: 50	: 66,690	: 266	: 24	: 26	:
23	:1928(L):	31	: 31,720	: 30	: 40,500	: 61	: 72,220	: 288	: 30	: 30	: 1
	:1929(M):	45	: 45,600	: 20	: 22,330	: 65	: 67,930	: 272	: 42	: 17	: 6
	:Sec.Tot:	113	: 132,700	: 88	: 110,630	: 201	: 243,330	: 972	:109	: 85	: 7
	:1926(J):	8	: 11,770	: 25	: 42,480	: 33	: 54,250	: 216	: 8	: 25	:
	:1927(K):	14	: 12,070	: 39	: 99,930	: 53	: 92,000	: 368	: 14	: 39	:
24	:1928(L):	28	: 37,080	: 50	: 75,910	: 78	: 112,990	: 452	: 28	: 47	: 3
	:1929(M):	28	: 42,540	: 29	: 44,140	: 57	: 86,680	: 346	: 23	: 26	: 8
	:Sec.Tot:	78	: 103,460	: 143	: 242,460	: 221	: 345,920	: 1,382	: 73	:137	: 11
	:Totals :	191	: 236,160	: 231	: 353,090	: 422	: 589,250	: \$2,354	:182	:222	: 18

The foregoing data show the conditions that have existed on Sections 23 and 24 for the last four seasons. A comparison of the check and experimental sections on the basis of percentage of total infestation for the four years occurring during one year shows no increase on Sec. 24. ~~That~~ can be interpreted as being due to turpentine operations. In both sections there was a rapid increase in the number of trees killed by Dendroctonus jeffreyi during the seasons of 1927 and 1928, but in 1929 a sharp decline occurred. In Sec. 23 the number of trees killed by Dendroctonus brevicornis increased steadily from 1926 to 1929, and in Sec. 24 a similar but less noticeable increase took place. The insect losses, calculated on the basis of timber value at \$4.00 per M., are not high. These cannot be said to be indicative of losses in the surrounding area, for the regions to the north of the sections included in the survey exhibited a much more severe infestation, which is closely simulated by that of the north tier of forties in Secs. 23 and 24. Calculating on the basis of losses during 1928 and 1929 in that tier of forties, an annual loss of between \$750 and \$800 per section would be incurred.

The infestation throughout the Harvey Valley area on the south slope of Harvey Mountain is not in groups of trees, but in general is scattered. The road cruise through the forest east of Sec. 24 showed an infestation of one tree to 2.2 acres in the first mile, and one tree to 5 acres in the second mile, part of which was through a different type of stand. The strip through Sec. 24 showed an infestation of one tree to 2.5 acres. These strip counts point to the same conclusions as are suggested by the data gathered in Secs. 23 and 24, i.e.: there has been no apparent concentration of beetles in the turpentine area, and the course of the infestation within the production area has maintained the same relative intensity as is found throughout the surrounding territory.

Project Area, Lassen Nat. Forest Unit, Harvey Valley, Turpentine Experimental Area.

Date, May 22 - 27 - 1930. Cruise by Miller & Salman T. 33 N R. 8 E Sec. 23

Cruise by John Everett T. 33 N R. 8 E Sec. 24



x - Pinus jeffreyi • - Pinus ponderosa a - Duplicated numbers 1928 Trees
Boundary of Jeffrey pine yellow pine Type - - - Turpentine Area